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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCGUTHRY BANKS, TIMA MICHELE

ART UNIT

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1793

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,908	<b>Applicant(s)</b> ACKERMANN ET AL.	
	<b>Examiner</b> TIMA M. MCGUTHRY-BANKS	<b>Art Unit</b> 1793	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Status of Claims***

Claims 1, 2, 4-9, 11, and 13-15 are currently amended and Claims 3, 10, 14, 16, and 17 are new.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, 5, 7 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Phillips et al (US 5,240,492).

Phillips et al anticipates the claimed invention. Phillips et al teaches a metallurgical flux used to cover molten metal in metallurgical vessels (column 1, lines 4 and 5) in granular or briquette form (line 56). The granules or briquettes, when applied to the surface of a molten metal, expand due to the effect of the heat of the metal on the expanding agent and thereby disintegrate back to their particulate or powder constituents in-situ (lines 60-64). The claimed properties of porosity are met by the teaching of Phillips et al. Regarding Claim 4, the flux is in granular or briquette form. Regarding Claim 5, the granules expand. Regarding Claim 7, the

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alumina used in the flux composition is calcined (column 3, line 12). Regarding Claim 8, the flux includes CaO and Al<sub>2</sub>O<sub>3</sub> (column 2, lines 40-45), which reads on calcium aluminate.

Claims 1-4, 6, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Breault et al (US 5,407,459).

Breault et al anticipates the claimed invention. Breault et al teaches preparing sintered calcium aluminates that can be used as a protective cover for liquid metals (abstract). It is used as a protective cover slag on liquid steel (column 3, line 26). Regarding Claims 2 and 3, the particle size is ¼ - ½ inch (6.35-12.7 mm) (column 3, line 37). Regarding Claim 4, the mixture is shaped into (line 16). Regarding Claim 6, the mixture is calcined (line 1). Regarding Claim 8, the mixture includes calcium aluminates. Regarding Claims 9 and 10, the ratio is shown in Figure 2, between 0.67 and 1.50. Regarding Claim 10, the mixture also comprises MgO (Table 1).

Claims 13 and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Klatt et al (US 6,342,088 B1).

Klatt et al anticipates the claimed invention. Klatt et al a granular thermal insulation material for molten metals in ladles and tundishes (column 1, lines 4 and 5). The method for producing the material comprises admixing rice hull ash, adding water to form a slurry, forming the slurry mixture into granules, and substantially drying the material (column 2, lines 56-62), wherein the drying step can be carried out at temperatures of 100 °C to 130 °C (column 3, lines 14-18). Regarding the step of providing at least one raw material which is dewatered or calcined, rice hull ash is inherently dewatered. Regarding the limitation of a ceramic bond or a sintered bond, that the granulation produced a dried product means that some bonding exists to

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maintain the structure. Regarding Claim 15, the binder used is water. Regarding Claims 16 and 17, the material provides thermal insulation to cover the molten metal surface.

Claims 13 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Breault et al.

Breault et al anticipates the claimed invention. Breault et al teaches preparing sintered calcium aluminates that can be used as a protective cover for liquid metals (abstract). The process comprises mixing dross residues with CaO particles, contacting the mixture with water, shaping the resulting mixture into green shapes, and calcining the mixture (column 2, line 67 to column 3, line 20). Regarding the step of providing at least one raw material which is dewatered or calcined, Breault et al teaches that the dross is dried to remove water (column 4, lines 38 and 39). Regarding Claim 15, the binder is water. Regarding Claims 16 and 17, the sintered calcium aluminate is used as a protective cover for liquid metals.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 3, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phillip et al as applied to claim 1 above.

Phillip et al discloses the invention substantially as claimed. The minimum size of the bonded particles is 0.5 mm diameter and the maximum size is 50 x 40 x 20 mm (column 13 and 14). The amount of CaO/SiO<sub>2</sub> is ranges from 5-99.9%, the amount of Al<sub>2</sub>O<sub>3</sub> ranges from 0-30%, and the amount of MgO ranges from 0-95% (lines 40-45). Regarding Claims 2, 3, 9 and 10, in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists. See MPEP § 2144.05.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breault et al as applied to claim 13 above, and further in view of JP 11278916 (from Derwent Acc No. 2000-016612).

Breault et al discloses the invention substantially as claimed. However, Breault et al does not disclose that the size of the aluminum dross residue is less than 90 µm as claimed. JP '916

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teaches refractory raw material manufacture from aluminum dross residual ashes. The dross material ashes obtained after sitting is 74  $\mu\text{m}$  or less (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the aluminum dross residues in Breault et al would be within the size range as taught by JP '916, since JP '916 teaches that this provides chemically stable and harmless refractories raw material and saves resources by reducing waste quantity of aluminum dross residual (abstract).

Claims 1, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phoenix et al (US RE 31,589) in view of Jones et al (US 4,014,684).

Phoenix et al (US RE 31,589) teaches a material and method for preventing heat loss from molten metal, one side of this material being impregnated with heat insulating refractory or exothermic material. The metal facing surface of this fibrous mat uses an exothermic of the type employing a finely divided oxidizable material (column 2, lines 36-39). Regarding Claims 11 and 12, the impregnated side has a porosity of less than about 50 AFS units and contains a binder (abstract). Lacking any other support for the definition of AFS units, the examiner interprets this teaching as being directly related to the percent by volume of porosity. Though Phoenix et al teaches using an oxidizable material such as aluminum calcium silicide (column 2, line 39), Phoenix et al does not specifically claim forming a slag as in Claim 1.

Jones et al teaches desulfurizing molten ferrous metal by the use of a lime-based flux composition (abstract). To enhance desulfurization potential, included in the flux are easily oxidized materials such as aluminum and calcium silicide (column 2, lines 26-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the metal facing surface of the fibrous mat would form a slag as claimed, since Jones et al teaches that

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oxidation of, for example, aluminum leads to the formation of a fluid mobile slag (column 2, lines 39-43).

### ***Conclusion***

JP 07214287 teaches a heat insulating material for molten metal comprising blocked rice hulls. The size of the rice hulls are 0.1-30 mm (abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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1793

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